Base Year 1999 By: M. Nguyen

SOURCE INVENTORY

CATEGORY # 1434

PORTABLE FUEL CONTAINER SPILLAGE

1999 EMISSIONS

Introduction

Portable fuel containers or "Gas cans", and gas can spouts are used to refuel off-road engines and equipment (i.e. lawnmowers, chainsaws, motorcycles, etc.). Portable fuel containers are made of either plastic or metal in variety shapes and sizes ranging form one to more than six gallons capacity. Portable fuel containers are designed for transportation, storing and dispensing fuel. The California Air Resource Board (CARB) regulates all portable fuel containers manufactured for sale and use in 2000. The regulations are intended to reduce refueling emissions from equipment and engines in the off-road categories that are predominantly refueled with portable fuel containers. The Mobile Source Control Division (MSCD) of CARB conducted surveys to establish the number of statewide portable fuel container population in 1998. These surveys show that there are 9,878,706 portable fuel container units statewide. The data also indicate that 94% of portable fuel containers are used in residential households, and 6% for commercial use. Therefore, the effect of the statewide regulations on commercial users (i.e., tree trimming services, landscape maintenance professionals, automobile tow services, etc.) would be insignificant. Using total container population and an average useful life of 5 years suggested by several manufacturers, ARB estimates the total sales of all portable fuel containers statewide.

Methodology

This category accounts for evaporative emissions resulting in spillage from refueling, transport and storage of the portable fuel containers. These portable containers contribute emissions by:

- permeation of vapors through walls in containers made from plastic;
- escaping fumes while fuel is being poured into equipment;
- spillage and/or over-filling as fuel is being poured into equipment;
- spillage and evaporation through secondary vent holes; and
- evaporation through inadequately capped spouts.

The MSCD survey indicated that 1,975,741 units of residential and commercial portable fuel container were sold in 1998. Assumed 20 percent of these units are sold in the Bay Area. This figure was derived from Bay Area household population compared to statewide data. CARB has grouped the various sizes of portable fuel containers into three categories as shown in Table 1.

Table1 – 1998 Statewide Residential and Commercial Sales Data

Container Sizes (gallons)	Annual Unit Statewide Sales
1 - 1.5	773,930
2 - 2.5	704,137
5 – 6	497,674
Total	1,975,741

The 1998 statewide uncontrolled ROG emissions from portable fuel containers are 93.4 tons per day statewide. The Bay Area contributes an estimated 20% or 18.7 tons per day, uncontrolled ROG emissions. The 1999 emissions are expected to be same as the 1998 emission level due to no major changes in regulation. Table 2 shows the 1999, 2000, 2006, and 2007 estimated Portable Fuel Container ROG emissions in the Bay Area.

Table 2 – Bay Area Portable Fuel Container ROG Emissions in 1999, 2000, 2006, and 2007

Year	**ROG Emissions** (Tons/Day)
1999	18.67
2000	18.20
2006	6.07
2007	4.95

CARB estimates 101.5 tons of uncontrolled ROG emissions per day statewide from portable fuel containers in 2007. The different emission categories associated with the use of portable fuel containers are listed by in Table 3. The table also illustrates the breakdown of residential and commercial emissions.

Table 3 – Statewide Portable Fuel Container ROG Emissions in 2007

Emission Category	Uncontrolled **Total** Emissions (tons/day)	Uncontrolled **Residential** Emissions (tons/day)	Uncontrolled **Commercial** Emissions (tons/day)
Displaced Vapor	2.5	2.4	0.1
Transport and Storage	10.4	3.8	6.6
Spillage	8.0	7.6	0.5
Permeation	8.3	7.9	0.4
Evaporation	72.3	66.8	5.4
Total	**101.5**	**88.5**	**13.0**

Monthly Variation

Monthly variation of emissions was based on the monthly California taxable gasoline data from the Board of Equalization.

County Distribution

County household population from ABAG was used to distribute emissions for each county.

TRENDS

History

Historical data (portable fuel container sales) were not available. Therefore, emissions were based on past years Bay Area household population.

Growth

ARB estimated 1998, 2007, and 2010 uncontrolled and controlled ROG emissions from portable fuel containers are listed in Table 4.

Table 4 – Statewide Portable Fuel Container ROG Emissions in 1998, 2007, and 2010

Year	Uncontrolled ROG Emissions (Tons/Day)	Controlled ROG Emissions (Tons/Day)
1998	93.4	----
2007	101.5	25.3
2010	103.6	25.8

Control

On September 11, 2000, CARB regulated all portable fuel containers manufactured for sale and use in California. The regulations require all portable containers and spouts will have an automatic shut-off feature to prevent overfilling of power equipment fuel tanks. The spouts will also have an automatic closing feature so the can will be sealed when it is not being used. The gas can regulations will prevent spills during equipment fueling and evaporation during fuel storage. ARB estimates an overall reduction in ROG emissions from portable fuel containers of 76.2 tons per day if the regulations are fully implemented by 2007. This figure represents approximately 75 percent reduction of emission.